

Ukraine: energy problems on the eve of the heating season

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On the threshold of the 2021–22 heating season, Ukraine finds itself in a rather difficult situation, which may result in periodic and local electricity shortages. This is the result of many factors, some of which are internal, while others result from trends in the global market. Although reserves of gas in underground storage are quite large, they may turn out to be insufficient in the event of a harsh and long winter, and it will be hard to replenish them due to the current shortage of gas and its high price on global markets. If things get worse, Ukraine's situation will be particularly difficult if Nord Stream 2 is launched quickly and most of the gas currently transmitted through Ukrainian territory was redirected through it.

A much bigger problem currently, however, is the small reserves of coal for power and heating plants (their share in Ukraine's electricity production exceeds 30%), which are barely a quarter of the planned amount. This makes it very likely that energy supplies to end users will be insufficient, as even the maximum generation of electricity from nuclear power plants may not be sufficient to meet demand in full. This may force Ukraine to resume electricity imports from Belarus, with which it has been having increasingly tense political relations.

The situation on the gas market

On 2 October Ukrtransgaz, the operator of Ukraine's underground gas storage facilities, finished the process of pumping gas in, and began its consumption the next day. Ukraine started the heating season with reserves of 18.7 bcm, which is much more than in previous years (see Chart 1). The exceptions were the 2019–20 season, when a large amount of gas was accumulated due to fears of a gas war with Russia, and the 2020–21 season, when unprecedentedly low global gas prices meant that EU traders started using Ukrainian warehouses.

However, Ukraine cannot freely dispose of all the gas it has accumulated. The levels in the warehouses must not fall below 5 bcm (this is the buffer gas which they need to continue functioning). Another 2.8 bcm is owned by traders (both Ukrainian and foreign) who can sell their fuel on the Ukrainian market but can also export it to EU countries. Nevertheless, even if all their gas were sold outside Ukraine (which is unlikely), there would still be 10.9 bcm of usable gas available (see Chart 2). In the 2014–20 heating seasons this amount was sufficient, but in the winter of 2020–21 the consumption of gas from storage amounted to 13.2 bcm, as the winter was colder than in previous years. This means that if the temperatures in the coming months are extremely low and remain so for a long time, Ukraine may find itself with a gas deficit at the end of the heating season. The situation will be particularly difficult if the Nord Stream 2 gas pipeline is launched before the end of the

season, and the gas which had so far been sent via Ukraine is redirected through it. This will mean a significant reduction in the amount of gas physically available in Ukraine's vicinity; that in turn will minimise the possibility of virtual gas reverses, make its purchase more difficult, and raise its prices on the European market (which is currently struggling with the problem of insufficient supplies and record gas prices).

The record high gas prices in Europe are already a growing problem for Ukraine, including its industry. This specially concerns the chemical industry, where the purchase of gas accounts for the majority of its production costs. For this reason, on 19 September, the Odessa Port Plant (*Odesskiy priportovyy zavod*), one of the largest producers of ammonia in Ukraine, decided to suspend its operations. According to media reports, other plants producing nitrogen fertilisers are considering similar steps.

The high gas prices are also a problem for institutions dependent on the state budget (schools, hospitals, etc.). The current rate for gas is around 40 hryvnia (\$1.50)/m³; that has caused suppliers to terminate contracts with such institutions *en masse*, because they do not want to sell fuel below its current market value, which is several times higher than the one set in their contracts. In turn, the state institutions cannot find new suppliers quickly while sticking to the tendering procedures, and do not have sufficient funds to purchase gas at such expensive prices. Therefore, as of 11 October, a state of emergency was announced in four districts which has made it possible to conclude contracts without tenders. In addition, on 12 October, Naftogaz allowed the state institutions to sign medium-term contracts at a price of 16.8 hryvnia (\$0.64)/m³. It seems likely that this step will – at least for the time being – avoid the spectre of a crisis on the eve of the heating season.

Critical situation in heating

The situation on the electricity generation market is much more worrying. According to data from the Ministry of Energy and Coal Industry from 17 October, the reserves of coal in the country's power and heating plants amounted to 753,000 tonnes rather than the 2.9 million tonnes planned in the schedule prepared by the ministry (see Chart 3). The shortage affects both power plants based on coal from the gas group and those using anthracite, which Ukraine is forced to import from Russia. Some of the plants only have enough coal to produce energy for a few more days.

Thermal energy is responsible for the generation of around 30% of electricity in Ukraine, but it is of key importance for balancing the network during peak periods of energy consumption. This has become even more important due to the development of renewable energy sources, the production of which is very unstable and depends on weather conditions. 70% of Ukrainian power plants belong to the DTEK group owned by oligarch Rinat Akhmetov, and the rest to the state-owned Centrenergo and several smaller entities. It is difficult to say exactly why sufficient coal stocks were not accumulated, but the ministry did not react early enough when coal stocks began to fall in June, and it was clear the plan could not be met if this trend continued.

Centrenergo's management argued that there were insufficient funds to purchase more coal because electricity consumers owed the concern too much money, as well as the low electricity prices which continued in the first half of 2021. For DTEK, another reason for the low stocks was the export of energy to the EU, the production of which consumed around 800,000 tonnes of coal. In addition, in the case of DTEK, there is a suspicion that they may

have been keeping coal stocks small deliberately as an instrument to blackmail the government with the possibility of causing an energy crisis in order to obtain favourable decisions, mainly related to electricity tariffs (similar cases have occurred in the past).

Ukraine mines over 70% of the coal which the domestic thermal power industry uses. Most of the mines are owned by DTEK, while the rest are in the hands of the state. This creates significant problems with supply logistics, as the state-owned mines are located in the western part of Ukraine, while the Centrenergo power plants are located in the central and eastern part of the country. In turn, DTEK's mines are located in the east, and some of the power plants in the west. The supply situation is particularly difficult during the harvest season, when Ukrainian railways generally struggle with a shortage of wagons and locomotives for the transport of goods.

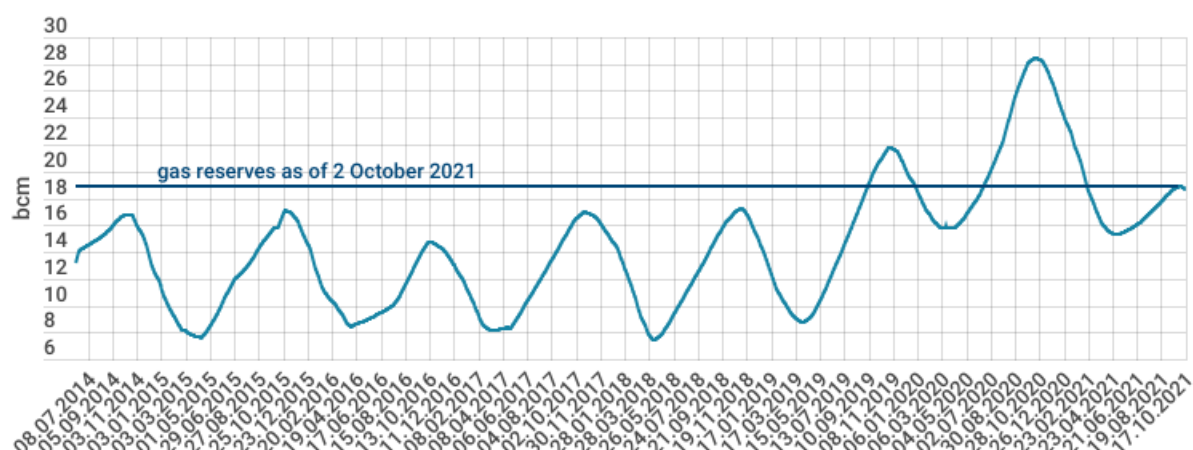
Both DTEK and Centrenergo have signed contracts for the import of gas coal, although the coal from their own extraction has usually been enough, and only anthracite has been imported (mainly from Russia), although there are anthracite mines in separatist-controlled areas in the Donbas. In August, DTEK reported that it had signed a contract for the supply of 320,000 tonnes from Poland, Kazakhstan and the US. The main problems are the high price of coal and the difficulty in obtaining it; this is related to the global shortage of the fuel, which has been noted in China and India among other countries.

Prospects

Ukraine's energy minister Herman Halushchenko announced on 8 October that 14 out of the country's 15 nuclear power units will be in operation to guarantee electricity supplies during the heating season (one will remain in reserve). Nevertheless it remains unclear whether the system will remain stable in the event of a failure or stoppage in any of the units. In the event of an extreme coal shortage, it will be possible to use natural gas or mazout (as an alternative) for combustion in some power plants. Centrenergo power plants resorted to this solution in the winter of 2021, but with the current record high gas prices and difficulties in increasing imports – a problem for European consumers also – such a step would be difficult, extremely uneconomical, and would increase the risk of gas shortages.

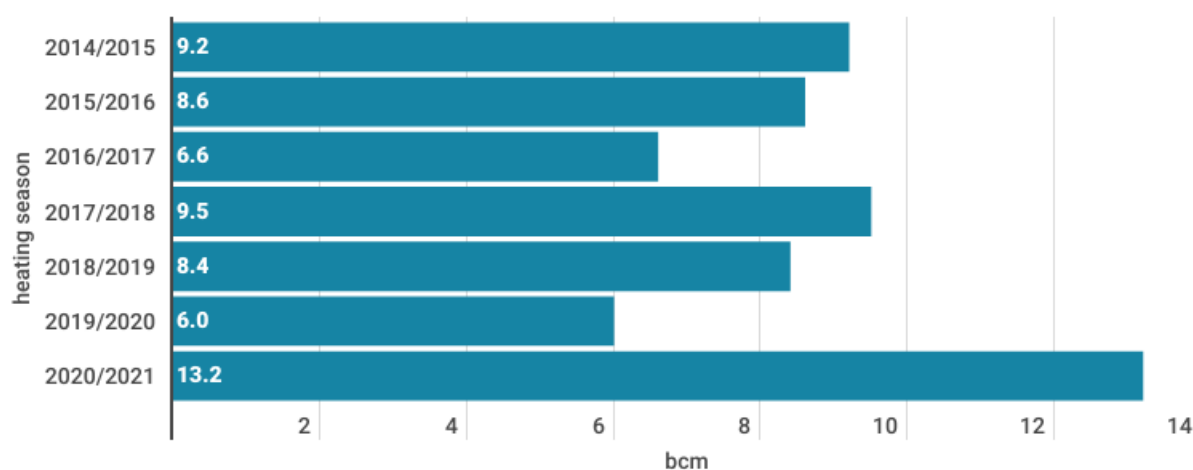
The most obvious solution in the event of a crisis would be to import electricity from Belarus and Russia, as happened last winter, allowing Ukraine to avoid local blackouts. Currently this is forbidden, but the ban expires on 1 November, and on 18 October Ukrenergo (the country's electricity network operator) announced a tender for access to transmission lines between Belarus and Ukraine. However, political relations between the two countries remain tense, although so far this has affected economic relations to only a very limited extent (for example, Ukraine did not join the EU's economic sanctions against Minsk). On the other hand, Belarus's financial gains from its electricity exports have been relatively small. According to data from the State Statistics Committee of Ukraine, the import of 554,000 kWh from January 2021 was worth US\$25 million, which in this year's bilateral trade is an insignificant amount (in the period from January to July this year, Ukrainian imports from Belarus amounted to US\$2.3 billion). At the same time, it should be emphasised that Belarus and Russia, despite having many instruments to trigger an energy crisis in Ukraine (gasoline, diesel oil, anthracite and nuclear fuel supplies), have not tried to use them in recent years. However, this does not mean that they will not try to do so in the coming months.

Chart 1. Gas stocks in underground storage facilities



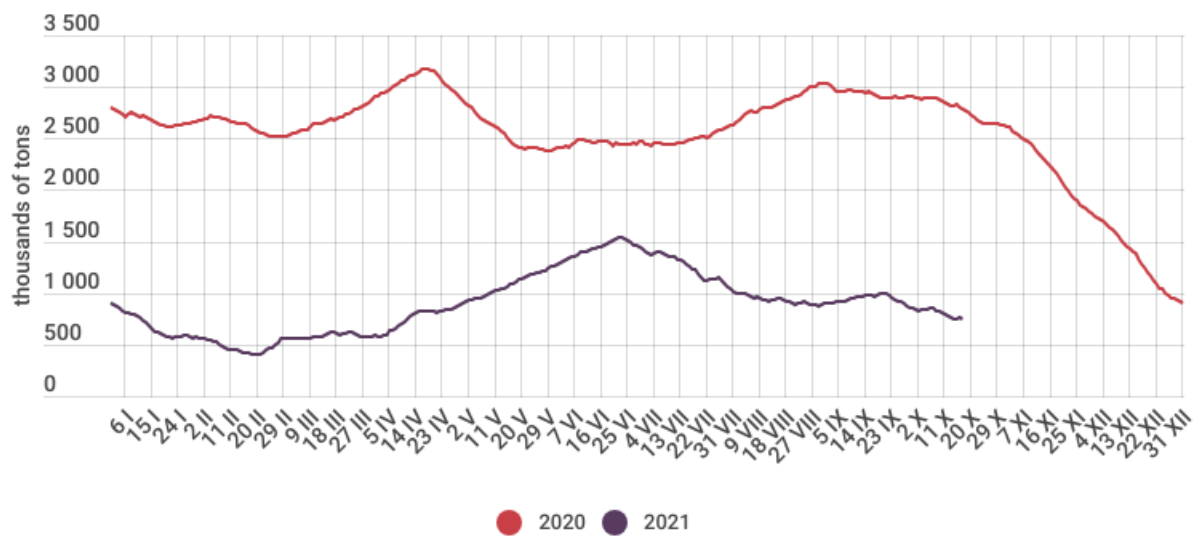
Source: author's research based on data from Ukrtransgaz and OGTSU.

Chart 2. Gas consumption from underground storage during heating seasons



Source: author's research based on data from Ukrtransgaz and OGTSU.

Chart 3. Coal stocks in power and heating plants



Source: author's research based on data from Ukrenergo.